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(54) IMAGE PROCESSING DEVICE

(57)Abstract:

PURPOSE: To provide an image processing device in which no deviation occurs in an odd-numbered field and an even-numbered field when field image data is compensated and reproduced.

CONSTITUTION: This image processing device is equipped with frame memory 2 which stores transiently the field image data on a recording medium 1, a compensation device 4 which applies compensation processing to the image data stored in the memory 2, a memory control part 3 which controls the read/ write of the memory 2, and a CPU 8 which discriminates field attribute information. When the compensation processing is performed, the write position on the memory 2 of the field image data is set and

changed to an odd-numbered line or even-numbered line corresponding to the odd number or even number of the field attribute information relating to the field image data.

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2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] A playback means to reproduce field image data from the record medium which recorded the field attribution information which starts this field image data with field image data, The image memory which memorizes temporarily the field image data reproduced by this playback means, A interpolation means to interpolate and output the field image data memorized in this image memory, It is the image processing system equipped with a memory control means to control writing and read-out of the above-mentioned image memory. The above-mentioned memory control means It responds to the odd number thru/or even number of field attribution information concerning the reproduced field image data which should be interpolated. The image processing system characterized by including the means which makes a setting change of the write-in Rhine location to the above-mentioned image memory of the field image data concerned in an odd-line location thru/or an even-line

location, respectively.

[Claim 2] A playback means to reproduce field image data from the record medium which recorded the field attribution information which starts this field image data with field image data, The frame memory which memorizes temporarily the field image data reproduced by this playback means, A interpolation means to interpolate and output the field image data memorized by this frame memory, It is the image processing system equipped with a memory control means to control writing and read-out of the above-mentioned frame memory. The above-mentioned memory control means When the reproduced field image data which should be interpolated corresponds to the odd number field, while writing in the odd-line location in the above-mentioned frame memory, the image data concerned When the interpolation image data interpolated by the above-mentioned interpolation means from these image data is written in the even-line location in this memory and the reproduced field image data which should be interpolated corresponds to the even number field, While writing in the even-line location in the above-mentioned frame memory, the image data concerned The image processing system characterized by including a means to control the interpolation image data interpolated by the above-mentioned

interpolation means from these image data to write in the odd-line location in this memory.

[Claim 3] The solid state image sensor which reads the charge corresponding to an optical image per field, and outputs it, The record means which records on the record medium which processed the field picture signal outputted from this solid state image sensor in the gestalt suitable for record, and was applied, The photography trigger operating member which directs photography initiation, and the control means controlled to perform continuously image recording to the record medium by the above-mentioned record means at the rate of predetermined as long as this photography trigger operating member is operated, It is preparation **********. The above-mentioned control means In continuation record of the field image to the record medium by the above-mentioned record means as one common attribute information on these continuation record image A series of seriography record number-of-sheets information and 60/n=m sheet (n and m)/second one or more integers -- carrying out -- the image processing system characterized by including a means to control to record field attribution information including the field generating pattern

information based on the rate concerned set up out of the seriography recording rate specified.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to an image processing system, the image processing system which carries out interpolation processing of the field image data, or the image processing system which incorporates field image data in detail.

[0002]

[Description of the Prior Art] As a technique of the common knowledge about an image processing system, the thing about record or the still video camera as picture reproducer to reproduce, and a still video image transcription regenerative apparatus is known in the field picture signal of a television signal. The image data recorded in the static-image regenerative apparatus which is one of the common image processing systems as shown in the flow chart of drawing 15 has ****** which distinguishes whether it is a frame image and whether it is a field image, in the case of a frame image, it reproduces as it is, in the case of a field image, interpolation processing is performed, and the method reproduced after generating false frame image data is taken. At this time, distinction of the field and a frame distinguishes using attribute information, such as a file header added to image data.

[0003] Moreover, the picture signal processor indicated by JP,4-111690,A proposed as a typical static-image regenerative apparatus of the conventional image processing system has the configuration shown in the block block diagram of drawing 16 .

[0004] In the above-mentioned picture signal processor, interpolation processing of the image data which the image file currently recorded on the record medium 51 consisted of the file header on which the image parameter etc. was recorded, and image data, and this image data was read into the frame memory 52, and was read into the frame memory 52 is carried out by the interpolation processor 54. That is, a frame memory 52 and the interpolation processor 54 are controlled by the memory control section 53, take an average with the image data in a certain scan line currently recorded on the frame memory 52, and the data of the contiguity pixel in the next scan line, write it in the dead number ground of a frame memory 52 in order as pixel data interlaced in the next field of the field signal which is having this memorized, and generate false frame image data. The flow chart of drawing 17 explains processing in this memory control section 53 to a detail.

[0005] In this memory control section 53, the image data read from the record

medium 51 is written in a frame memory 52 for every scan line. The 1st line of the image data recorded on that occasion is written in the 1st line of a frame memory 52 (step S31). Next, the 2nd line of the recorded image data is written in the 3rd line of a frame memory 52 (step S32).

[0006] The activity which writes hereafter the n-th line which is last Rhine of the image data which repeated the same activity and was recorded in the Rhine (2n-1) eye of a frame memory 52 (step S34), and writes the recorded image data in a frame memory 52 is ended. Next, in order to interpolate Rhine between Rhine of the image data written in this frame memory 52, the image data of the 3rd line of a frame memory 52 is outputted to the interpolation processor 54 with the 1st line, and the result of an operation in the interpolation processor 54 is written in the 2nd line of a frame memory 52 (step S35).

[0007] Hereafter, the same activity is done, the image data of the Rhine (2n-3) eye of a frame memory 52 and the Rhine (2n-1) eye is outputted to the interpolation processor 54, and the result of an operation in the interpolation processor 54 is written in the Rhine (2n-2) eye of a frame memory 52 (step S37). It means that false frame image data had been written in the frame memory 52 by the above processing.

[0008] The data of the record field and the interpolated field are memorized in order from a top as mentioned above in the physical address of a frame memory 52. The read-out timing of a frame memory 52 is controlled by the memory control section 53, and is outputted to D/A converter 55 (step S38). And the image data read from the frame memory 52 serves as an analog signal again with D/A converter 55, and serves as TV signal (video signal) with an encoder 56. In addition, in an encoder 56, the synchronizing signal generated from a synchronizing signal generator 57 is added to the output signal of D/A converter 55.

[0009]

[Problem(s) to be Solved by the Invention] The odd number field photoed by the same image with the static-image regenerative apparatus of above JP,4-111690,A and the even number field are respectively outputted as a frame picture signal, and the trouble in this static-image regenerative apparatus is explained with reference to drawing 18 which shows the situation when displaying on a monitor, drawing 19 , and drawing 20 . Rhine which Rhine which drawing 18 shows the location of the scanning line at the time of recording, and is shown as a continuous line shows the scanning line when photoing the odd

number field, and is shown by the dotted line shows the location of the scanning line when photoing the even number field. Drawing 19 shows the scanning line at the time of performing interpolation processing and reproducing from the image data of the odd number field, and drawing 20 shows the location of the scanning line at the time of performing interpolation processing and reproducing from the image data of the even number field. However, Rhine which drawing 19 and Rhine shown as a continuous line in 20 show the location of the scanning line of a record image, and is shown by the dotted line shows Rhine by the interpolated image data by which interpolation processing was carried out, and shows it as line number Ln '.

[0010] The odd number field image data recorded in drawing 18 is Rhine L1 to the beginning in a frame memory like drawing 19 which serves as image data shown by the scanning line L1, L3 and L5, and --, and shows the location of the scanning line of a playback image. It is L3 to the frame memory which image data was written in and then was flown by one line. Image data is written in. Hereafter, odd number field image data is written in sequence at a frame memory 52.

[0011] Furthermore, Rhine L1 currently recorded on frame image memory in

order to reproduce this field image data Pixel data and its next Rhine L3 It is L1 and L3 as image data of Rhine L2 ' interlaced in the next field of the field signal which interpolation processing which takes an average with the data of a contiguity pixel which can be set is performed [signal], and is having this memorized. It writes in the frame image memory between Rhine. Hereafter, the image data of L4 ', L6 ', and -- is similarly written in the frame memory 52 one by one.

[0012] The above processing is controlled by the memory control section 53, the false frame image with which interpolation processing was made is created, and the frame image of a field angle equivalent to the time of photography is reproduced.

[0013] About the location of the scanning line of a playback image, the even number field image data recorded in drawing 18 is Rhine L2 to the beginning in frame image memory, as it becomes Rhine L2, L4, L6, and data of -- as shown by the dotted line of the scanning line, and shown in drawing 20 . It is Rhine L4 to the memory area which image data was written in and then was flown by one line. Image data is written in.

[0014] This Rhine L2 and Rhine L4 The read memory area is Rhine L1 when

recording the odd number field. Rhine L3 It is equivalent to the read memory area. Rhine L2 currently recorded on frame image memory in order to read even number field image data into sequence at frame image memory and to reproduce this field image data further hereafter Pixel data and its next Rhine L4 Interpolation processing which takes an average with the data of a contiguity pixel which can be set is performed.

[0015] It is Rhine L2 and L4 as pixel data of Rhine L3 ' interlaced in the data obtained by this interpolation processing in the next field of the field signal of memory with which image data is memorized. It writes in the frame image memory of a between. Hereafter, the false frame image of L5 ', L7 ', and -- with which image data was also written in the frame memory 52 one by one, and interpolation processing was made is created similarly.

[0016] As mentioned above, the image data to which the field image data recorded in spite of having taken a photograph with the same field angle so that clearly from explained drawing 19 and drawing 20 is interpolated and outputted by the difference between the odd number field and the even number field will turn into frame image data shifted one line, and the data will become a video output as it is. Therefore, in case comparison examination especially precise

between images is performed, there is a possibility that the above-mentioned Rhine gap may become a fatal defect.

[0017] What was based on the specification of JEIDA (Japan Electronic Industry Development Association) in the conventional static-image record regenerative apparatus on the other hand as shown in drawing 7 is common. If the number of sheets/second photoed make [many] it, the image amount of data incorporated increases, and in case it shoots continuously in such a static-image record regenerative apparatus, since the file header is prepared for every sheet of the photoed image data, the increment in the data volume by the file header part will also be remarkable, and will become huge [the total amount of data]. Furthermore, there was fault of becoming a failure by this also when accelerating record processing speed.

[0018] In case this invention is made in order to solve above-mentioned fault, and it carries out interpolation playback of the field image data, it sets it as one purpose to offer an image processing system which a gap does not produce in the odd number field and the even number field. Moreover, when performing a seriography, it is possible to suppress the increment in the capacity of record image data, and it sets it as other purposes to offer the image processing system

which can accelerate an image data-logging rate.

[0019]

[The means and operation] which solve a technical problem A playback means to reproduce field image data from the record medium which recorded the field attribution information which one image processing system of this invention requires for this field image data with field image data, The image memory which memorizes temporarily the field image data reproduced by this playback means, A interpolation means to interpolate and output the field image data memorized in this image memory, It is the image processing system equipped with a memory control means to control writing and read-out of the above-mentioned image memory. The above-mentioned memory control means According to the odd number thru/or even number of field attribution information concerning the reproduced field image data which should be interpolated, the means which makes a setting change of the write-in Rhine location to the above-mentioned image memory of the field image data concerned in an odd-line location thru/or an even-line location, respectively is included.

[0020] In the above-mentioned image processing system, a setting change of the write-in Rhine location to the above-mentioned image memory of the field

image data concerned is made in an odd-line location thru/or an even-line location according to the odd number thru/or even number of field attribution information concerning the reproduced field image data which should be interpolated, respectively.

[0021] A playback means to reproduce field image data from the record medium which recorded the field attribution information which other one image processing system of this invention requires for this field image data with field image data, The frame memory which memorizes temporarily the field image data reproduced by this playback means, A interpolation means to interpolate and output the field image data memorized by this frame memory, It is the image processing system equipped with a memory control means to control writing and read-out of the above-mentioned frame memory. The above-mentioned memory control means When the reproduced field image data which should be interpolated corresponds to the odd number field, while writing in the odd-line location in the above-mentioned frame memory, the image data concerned When the interpolation image data interpolated by the above-mentioned interpolation means from these image data is written in the even-line location in this memory and the reproduced field image data which should be interpolated

corresponds to the even number field, While writing the image data concerned in the even-line location in the above-mentioned frame memory, a means to control the interpolation image data interpolated by the above-mentioned interpolation means from these image data to write in the odd-line location in this memory is included.

[0022] In the above-mentioned image processing system, when the reproduced field image data which should be interpolated corresponds to the odd number field, while writing the image data concerned in the odd-line location in the above-mentioned frame memory, the interpolation image data interpolated from these image data is written in the even-line location in this memory. Moreover, when the reproduced field image data which should be interpolated corresponds to the even number field, while writing the image data concerned in the even-line location in the above-mentioned frame memory, the interpolation image data interpolated from these image data is written in the odd-line location in this memory.

[0023] The solid state image sensor which one image processing system of further others of this invention reads the charge corresponding to an optical image per field, and is outputted, The record means which records on the record

medium which processed the field picture signal outputted from this solid state image sensor in the gestalt suitable for record, and was applied, As long as the photography trigger operating member which directs photography initiation, and this photography trigger operating member are operated It is the image processing system equipped with the control means controlled to perform continuously image recording to the record medium by the above-mentioned record means at the rate of predetermined. The above-mentioned control means In continuation record of the field image to the record medium by the above-mentioned record means as one common attribute information on these continuation record image A means to control to record field attribution information including a series of seriography record number-of-sheets information and the field generating pattern information based on the rate concerned set up out of the seriography recording rate specified in a second in 60/n=m sheet (n and m are taken as one or more integers) /is included.

[0024] In the above-mentioned image processing system, it controls to record a series of seriography record number-of-sheets information and field attribution information including the field generating pattern information based on the rate concerned set up out of the seriography recording rate as one common attribute

information on these continuation record image in continuation record of the above-mentioned field image.

[0025]

[Example] Hereafter, the example of this invention is explained using drawing. Drawing 1 is the block block diagram of the static-image regenerative apparatus which is an image processing system of the 1st example of this invention. In a static-image regenerative apparatus, although false frame image data is generated based on the field image data recorded on the record medium, the configuration and processing actuation of the static-image regenerative apparatus are explained.

[0026] In the above-mentioned static-image regenerative apparatus, the image data recorded on the record media 1, such as a memory card, and a magnetic disk or an optical disk, is read into a frame memory 2. At this time, a frame memory 2 reaches the odd fields beforehand. The memory cell which stores the image data of the even number field is decided. This is decoded in CPU8 which builds in a means to recognize the FID code which is the field attribution information currently recorded on image data together. This CPU8 By directing the field which writes a field image in a frame memory 2 in the memory control

section 3 which builds in write-in odd number thru/or an even-line location modification means Odd number field data and even number field data are read into the predetermined address of a frame memory 2.

[0027] In addition, although, as for the image data read from the frame image memory 2, interpolation processing is performed by the interpolation processor 4 as a interpolation means, CPU8 issues directions so that the image data written in the frame memory 2 to the interpolation processor 4 may be made into a dimension and another field may be interpolated. In the interpolation processor 4, an average with the pixel data of a scan line and the data of the contiguity pixel in that next scan line will be taken, and this interpolated data will be written in the dead number ground of a frame memory 2 in order as pixel data interlaced in the next field of the field signal memorized.

[0028] If the flow chart of drawing 2 explains interpolation processing actuation of the field image data in the above-mentioned memory control section 3 to a detail, the FID code first indicated together with the recorded image data will be decoded by CPU8, and a FID flag signal will be inputted into the memory control section 3. The field of the image data currently recorded by this FID flag signal is the odd number field, or a certain distinction of that is performed even Field (step

S0).

[0029] Although processing of steps S1-S7 of the 1st processing section is performed when the image data currently recorded is the odd number field, this processing is the same processing as the control in the conventional memory control shown in drawing 17 mentioned above. Moreover, when the image data currently recorded is the even number field, processing of steps S11-S17 of the 2nd processing section is performed.

[0030] That is, the 2nd line of the image data which writes the data of the 1st (L1) line of the recorded image data in the 2nd (L2) line of a frame memory 2 (step S11), next is recorded is written in the 4th line of a frame memory 2 (step S12).

[0031] Hereafter, the same activity is repeated and the activity which writes (step S14) and the recorded image data in a frame memory 2 by writing the data of the n-th (n is one or more predetermined integers) line which are last Rhine of the image data currently recorded in the 2xn-th line of a frame memory 2 is ended further.

[0032] Next, in order to interpolate between the scan lines of the image data written in the above-mentioned frame memory 2, the image data of the 4th line of a frame memory 2 is outputted to the interpolation processor 4 with the 2nd line,

and the image data obtained by the interpolation processing is written in the 3rd line of a frame memory 2 (step S15).

[0033] Hereafter, the same activity is done, the image data of the Rhine (2xn-2) eye of a frame memory 2 and the image data of the 2xn-th line are outputted to the interpolation processor 4, and the result of an operation in the above-mentioned interpolation processor 4 is written in the Rhine (2xn-1) eye of a frame memory 2 (step S17). It means that false frame image data had been written in the frame memory 2 by processing in the above-mentioned 1st or 2nd processing section.

[0034] The location of the scanning line of a playback image in case the image data recorded as being based on above-mentioned processing is the odd number field and the even number field is shown in drawing 3 and drawing 4 , respectively, and when image data is the odd number field, the data of the record field and the interpolated field will be memorized in order from a top in the physical address of a frame memory 2. On the other hand, when image data is the even number field, the data of the interpolated field and the record field will be recorded in order from on the physical address of a frame memory 2. However, since there is no associated data which should carry out a

interpolation operation with the data of the 2nd line in the data written in the 1st line of a frame memory in the case of this even number field, it considers as the data of 0 level, or it is the data L2 of the 2nd line. It processes applying one half of values etc.

[0035] In addition, the read-out timing of a frame memory 2 is controlled by the memory control 3, and the image data read from the frame memory 2 serves as an analog signal again with D/A converter 5, and is outputted as a video signal by the encoder 6. In addition, the synchronizing signal outputted from a synchronizing signal generator 7 to the output signal from D/A converter 5 with an encoder 6 is added.

[0036] As mentioned above, according to the static-image regenerative apparatus of this example, by changing the address of the memory which forms CPU8, reads the FID code of record data, and is written in a frame memory based on the information, even if the recorded fields differ, a false frame image which was produced with the equipment of the conventional example and which does not have the gap of one line is reproducible.

[0037] Next, it explains, referring to the block block diagram of drawing 5 etc. about the processing which generates false frame image data based on the file

organization and this field image data about the field image data in the static-image regenerative apparatus which is an image processing system of the 2nd example of this invention recorded on a record medium.

[0038] Image data is recorded on the IC memory card 10 as a record medium. Based on the specification of JEIDA (Japan Electronic Industry Development Association) where this image data is the most common, the file organization of that image each consists of a file header and image data, as shown in drawing 6 . The above-mentioned file header consists of parameter tuples on which the information on the format tuple on which format information is recorded, the record time tuple which record time is describing, and other image parameters etc. is recorded.

[0039] There is an item which records a setup of Tuple ID, a tuple [degree] pointer, a scanning mode, a gamma property, the number of pixels, etc. as shown in drawing 7 in the image parameter tuple, and as the setting section of the scanning mode of them shows to drawing 8 , the attribute information on the field is indicated.

[0040] The IC card interface 12 to which the above-mentioned IC memory card 10 is connected has the function to manage access to the IC memory card 10.

Moreover, since the image data currently recorded on said IC memory card 10 is compressed by the compression method based on the specification of JPEG, the Huffman decryption is carried out in the expanding section 13, this decrypted image data is transmitted to the DCT processing section 14, and the block image data of 8x8 is computed by reverse discrete cosine conversion in the DCT processing section 14, and it is transmitted to a frame memory 15. In addition, the IC card interface 12, the expanding section 13, and the DCT processing section 14 are controlled by CPU11 which builds in a playback means. Moreover, in this CPU11, decode of the field attribution information indicated by the parameter tuple of the file header section of the recorded image data is also performed.

[0041] The image data transmitted to the frame memory 15 reads the FID flag signal with which CPU11 identifies and outputs odd number or the field attribution which shows the even number field in the memory control section 17, and specifies the memory address of Rhine for writing in the image data transmitted by odd number field image data and even number field image data from the DCT processing section 14.

[0042] In the equipment of this example, the address which stores the image

data of a scan line is 00--0000, 00--0001, 00--0010, 00--0011, and -- from the upper memory for one line, as shown in drawing 9 . And LSB (least significant bit) serves as a bit which shows a field attribution, a value 0 shows the memory in which one line of the image data of the odd number field is stored, and the value 1 shows the memory in which one line of the image data of the even number field is stored. Furthermore, about the bit except LSB, the Rhine location of a from when it can set in each field is expressed. Therefore, the image data transmitted from the DCT processing section 14 according to the principle of this address is stored in the predetermined address position in memory.

[0043] Next, although interpolation processing is performed by the interpolation processor 16 and the field image data stored in the frame memory turns into false frame data, the configuration of this interpolation processor 16 is shown in drawing 10 . It incorporates in an order from the memory of the Rhine correspondence above-mentioned [the image data stored in the frame memory 15], and the inputted image data is inputted into 1H derailer in-memory 16a. In equalization circuit 16b which makes an input signal the image data before the output of the 1H derailer in-memory 16a, and 1H derailer in-memory input, the average of two image data is calculated and it outputs, and it writes in the

predetermined address of a frame memory in order as pixel data interlaced in the next field of the field signal memorized, and false frame-ization of image data is performed. In addition, this false frame-ized processing is the same processing as processing of the static-image regenerative apparatus of said 1st example.

[0044] Next, the picture signal formed into the false frame is transmitted to the D/A transducer 18, and after being changed into an analog signal by the D/A transducer 18, it is outputted as a video signal in the encoder section 19. In the encoder section 19, the synchronizing signal generated from a synchronizing signal generator 20 is also added to an output signal from the D/A transducer 18.

[0045] When writing record image data in a frame memory by decoding the file header of the image file recorded on the IC memory card 10 with the static-image regenerative apparatus of this example as having mentioned above by CPU11, and outputting the number information of field odd-even on the image data reproduced to the memory control section 17, it was made to write in a predetermined frame memory field based on the above-mentioned number information of field odd-even. Therefore, generating of the gap of one line by the difference between the odd number by the formation of a false frame of field

image data and the even number field is lost.

[0046] Moreover, when processing the image data by which a direct output is carried out from the image pick-up section of not only processing of the image data read from IC memory card but a field drive for example, is considered, the field picture signal of per second 60 coma is outputted. In the system which records the picture signal outputted from this image pick-up section with per second 4 coma, although the recorded image data will surely be recorded in order of the odd number field and the even number field, when it reproduces with the equipment of this example, in case the image data of two continuous coma recorded as mentioned above is reproduced on a monitor, the gap for one line does not arise.

[0047] In addition, not only when outputting the image data reproduced in this example to the monitor of interlace, but when reproducing on the monitor of non-interlaced methods, such as a personal computer, equivalent effectiveness can be acquired by controlling control of the memory control section 7 which is controlling the output of the false frame data stored in the frame memory by the non-interlaced method.

[0048] Moreover, although this example has shown the memory control

approach at the time of reproducing the recorded field image data, also in case the field image output from the image pick-up section is recorded as a false frame image in recording devices, such as an electronic "still" camera, same memory control is performed and equivalent effectiveness is acquired by recording.

[0049] As explained above, in case according to the picture reproducer of the electronic "still" camera of the 1st and 2nd above-mentioned example a photograph is taken with the same field angle and the recorded image data is reproduced, it can observe on a monitor, without producing the gap for one line of the playback image generated by the difference in a field attribution by performing false frame-ization in consideration of a field attribution.

[0050] Next, the electronic "still" camera as an image processing system in which the 3rd example of this invention is shown is explained. When recording field image data, the camera of this example is convenient for the field image recording data recorded when it shoots continuously generating false frame image data without a gap of Rhine with the image processing system of said the 1st and 2 example, and makes it possible further to reduce the information added to a data file as much as possible.

[0051] The configuration of the above-mentioned camera has composition as shown in drawing 11 , and, as for the video signal by which photo electric conversion was carried out by CCD31 which is the solid state image sensor of a field drive, signal processing, such as a gamma correction, is performed in the image pick-up process 32. Then, the above-mentioned video signal is changed into digital data in the A/D-conversion section 33, and is written in a frame memory 34. Furthermore, the image data recorded on the frame memory is recorded on a record medium through a record means. That is, in order to compress JPEG conformity, the image data which carried out discrete cosine conversion by the DCT transducer 37, and was encoded by the compression zone 38 is recorded on the IC memory card 39 which is a record medium. Moreover, in this camera, a synchronizing signal generator 41 and the memory control section 36 synchronize and operate. In addition, the image file recorded on the above-mentioned IC memory card 39 shall consist of a file header and image data at the usual photography recording mode.

[0052] Although it is common to record the image data using the field image data which is a movie output from CCD when shooting continuously, the field image data which is outputted from CCD in such a case becomes a part for the 60

fields in 1 second. If it is going to fix interval time amount in photography at this time, it will be given by m= 60/n (a sheet/second) photography coma several m for 1 second. However, n and m are one or more integers, and the interval in continuous shooting is given by n/60 (second) (refer to drawing 12). When using continuous shooting, it can respond enough in the number of sheets/second shown by the above-mentioned 60/n practical.

[0053] Moreover, as the field attribution in the above-mentioned number of photography coma is shown in a part for the topmost part of drawing 12 which shows the relation of the order of the odd number photoed with the number of coma / second in 60 coma (n= 1), and even number field image data in 1 second, the odd number field Fa and the even number field Fb are outputted in order. In the animation photography mode which records this output the period of photography record If started from the next field of the moment that the photography trigger carbon button 42 is pushed, the field data which is while the photography trigger carbon button 42 which is a photography trigger operating member is pushed, and is recorded first The sequence of the field attribution of the field data recorded becomes two kinds, the case where they are odd number, even number, odd number, even number, and --, and when it is even number,

odd number, even number, and odd number --. The case of the former is shown by above-mentioned drawing 12 .

[0054] Moreover, with 20 coma (n= 3), 12 coma (n= 5), and four coma (n= 15), the odd number field and the even number field will be recorded in order like 60 during 1 second coma in 1 second, and it becomes the combination of two kinds of records by the coma photoed first.

[0055] While [1 second] being related with the numbers of coma other than the above, furthermore, 30 coma (n= 2), 15 coma (n= 4), ten coma (n= 6), six coma (n= 10), five coma (n= 12), With three coma (n= 20), two coma (n= 30), and one coma (n= 60), only odd number Or it becomes only the image data of the even number field, and this odd number field or the even number field is determined by the timing on which the photography trigger carbon button 42 with which photography is started is pushed, and becomes the combination of two kinds of records.

[0056] The image parameter tuple in one common file header indicates the recording information of above-mentioned image data about the field image data of two or more coma photoed by continuous shooting. Control of these processings is performed by CPU40 which is a control means. That is, as

information indicated by the image parameter tuple, as shown in drawing 13 , the item which sets up a field attribution to the image parameter tuple (refer to drawing 7) of JEIDA conformity, and the number of photography coma by continuous shooting were added. Furthermore, as field generating pattern information, as shown in drawing 14 , it consists of 2 bits, in the bit of A, the item which sets up the above-mentioned field attribution describes the attribute information on the field data currently recorded first, by the bit of B, can show whether a field attribution changes by turns or it is still the same, and can record four kinds of field attributions.

[0057] This image data by which continuous shooting was carried out The above 1st, Or when continuation playback is carried out with the static-image regenerative apparatus which consists of equipment of the 2nd example, By decoding the file header of the image data of these single strings in CPU which is a control means, and distinguishing seriography record number of sheets and four kinds of continuous field attributions of image data using field generating pattern information The false frame image data from which a signal can be outputted to the memory control section, the field attribution information on the above-mentioned image data is easily acquired, and a gap of a scan line does

not produce a FID flag is generable with the image data reproduced.

[0058] Moreover, with the camera of this example, it becomes unnecessary to add a file header to each of image data, and storage capacity will decrease rather than the conventional continuation image data by this. Moreover, it becomes unnecessary to decode in CPU the image parameter tuple which recorded the field attribution from the image file header reproduced whenever it reproduces image data to coincidence, and processing speed becomes quick.

[0059]

[Effect of the Invention] in case a false frame is formed, according to the image processing system of this invention according to claim 1, the playback which carried out reading appearance as it was, without taking [as opposed to / especially / field image data] timing etc. into consideration, performed interpolation processing, and lost the gap for one line by odd number and the difference among even lines can perform by writing the field image data which distinguished the field attribution and was recorded in each corresponding Rhine location of an image memory according to this field attribution.

[0060] According to the image processing system of this invention according to claim 2, field image data is written in a frame memory with reference to field

attribution information, interpolation Rhine between the written-in image data is computed by interpolation processing, and the false frame image data which lost the gap for one line produced [line] by the difference in a field attribution by writing in the Rhine location where this memory corresponds is obtained simply, without especially taking read-out timing etc. into consideration.

[0061] When performing continuous shooting and movie photography, especially the image processing system of this invention according to claim 3 has remarkable effectiveness in respect of image data volume or a recording rate, and, in the case of continuous shooting etc., its second increases in m sheets (m is one or more integers) /which are photography image data number of sheets, but In the conventional image processing system, a file header is prepared in one one-sheet image data. The capacity of an image data file became large, and moreover, when writing an image data file in a record medium, the file header needed to be written in apart from image data, and when accelerating record processing speed, it had become a failure. However, according to the image processing system of this example, field attribution information common to a series of photography record images at the time of continuous shooting is given only to the top image field, this field attribution information is used at the time of

playback, and improvement in the speed of processing speed and reduction of the amount of information added to a sequential-image data file can be realized.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block block diagram of the static-image regenerative apparatus which is an image processing system of the 1st example of this invention.

[Drawing 2] The flow chart of interpolation processing actuation of the field image data in the static-image regenerative apparatus of drawing 1 .

[Drawing 3] Drawing showing the scanning line of a playback image in case the image data recorded with the static-image regenerative apparatus of drawing 1 is the odd number field.

[Drawing 4] Drawing showing the scanning line of a playback image in case the image data recorded with the static-image regenerative apparatus of drawing 1 is the even number field.

[Drawing 5] The block block diagram of the static-image regenerative apparatus which is an image processing system of the 2nd example of this invention.

[Drawing 6] Drawing showing the file organization of the image data in the static-image regenerative apparatus of drawing 5 .

[Drawing 7] Drawing showing the configuration of the image parameter tuple in a file header among the image data in the static-image regenerative apparatus of drawing 5 .

[Drawing 8] The part which shows a field attribution among the image parameter

tuples of the image data in the static-image regenerative apparatus of drawing 5 .

[Drawing 9] Drawing showing the memory address which stores the data on the scan line of the image data in the static-image regenerative apparatus of drawing 5 .

[Drawing 10] Drawing showing the configuration of the interpolation processor in the static-image regenerative apparatus of drawing 5 .

[Drawing 11] The block block diagram of the electronic "still" camera which is the image processing system of the 3rd example of this invention.

[Drawing 12] Drawing showing the order of record of the photography image data of the odd number field and the even number field to the number of photography coma per unit time amount at the time of continuous shooting in the electronic "still" camera of drawing 11 .

[Drawing 13] Drawing showing the configuration of the image parameter tuple in a file header among the image data in the electronic "still" camera of drawing 11

[Drawing 14] Drawing showing the setting code of the file attribute of the image parameter tuple in the electronic "still" camera of drawing 11 .

[Drawing 15] The flow chart of the processing reproduced after the interpolation in the static-image regenerative apparatus which is one of the conventional

common image processing systems

[Drawing 16] The block block diagram of the typical static-image regenerative apparatus of the conventional image processing system.

[Drawing 17] The flow chart of the interpolation processing in the conventional static-image regenerative apparatus of drawing 16 .

[Drawing 18] Drawing showing the scanning line which outputs respectively the conventional odd number field in a static-image regenerative apparatus and the conventional even number field of drawing 16 as a frame picture signal, and is shown a monitor table.

[Drawing 19] Drawing having shown the scanning line at the time of performing interpolation processing and reproducing from the image data of the odd number field in the conventional static-image regenerative apparatus of drawing 16 .

[Drawing 20] Drawing having shown the scanning line at the time of performing interpolation processing and reproducing from the image data of the even number field in the conventional static-image regenerative apparatus of drawing 16 .

[Description of Notations]

2 15 .... Frame memory (image memory)

3 17 .... Memory control section (a memory control means, the Rhine location modification means)

4 16 .... Interpolation processor (interpolation means)

8 11 .... CPU (playback means)

31 .... CCD (Solid State Image Sensor)

37 .... DCT Transducer (Record Means)

38 .... Compression Zone (Record Means)

40 .... CPU (Control Means)

42 .... Photography Trigger Carbon Button (Photography Trigger Operating Member)